Molecular Medicine Ireland

Annual Report 2011

Enabling Clinical and Translational Research
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Molecular Medicine Ireland Board

MMI welcomed the appointments of three new directors to the Board during 2011. Professor Anita Maguire, Vice-President for Research and Innovation at UCC, was appointed in April, while Professor Vincent Cahill, Dean of Research at TCD, and Professor John Kelly, Director of Research at RCSI, were appointed in September and November respectively. Professor Mike Clarke, Chair of Research at Queen’s University, Belfast and Director of the All-Ireland Hub for Trials Methodology Research, was appointed as an Observer for QUB to the MMI Board in November. (See page 14)

MMI Clinical and Translational Research Programme

The MMI Clinical & Translational Research Scholars Programme (CTRSP) was launched in October 2011 by Minister Sean Sherlock TD, Minister of State with special responsibility for Research and Innovation. The CTRSP was developed by MMI and its academic partners, NUI Galway, Trinity College Dublin, University College Cork and University College Dublin, after securing funding of €4.3m in 2010 under Cycle 5 of the Government’s Programme for Research in Third Level Institutions (PRTLI). The CTRSP is a structured 4-year PhD programme, integrated with both industry and clinical research centres, that will prepare graduates for careers in industry, academic medical centres and as biomedical entrepreneurs. (See Page 19)

ICRIN helps secure EU funding for a clinical trial in Alzheimer disease

ICRIN played a key role in Professor Brian Lawlor’s (St James’s Hospital and Trinity College Dublin) application for FP7 funding to conduct research into the prevention and treatment of Alzheimer disease. Siobhan Gaynor of the Irish Clinical Research Infrastructure Network provided advice on the set up and structure of a multinational trial and identified European partners who could collaborate, recruit patients and supply clinical trial services such as monitoring, data management and pharmacovigilance. The application was successful and was awarded €6m in 2011 by the European Union. The research project, known as NILVAD, will be the largest investigator-led clinical trial in Alzheimer disease ever conducted in Europe with over 500 patients. (See Page 28)
MMI Highlights 2011 (cont’d)

MMI Clinician Scientist Annual Meeting 2011

The Third Annual Scientific Meeting of the MMI Clinician Scientist Fellowship Programme took place in July 2011. Clinician Scientists pursuing research training in MMI’s five partner institutions through the MMI Clinician Scientist Fellowship Programme (CSFP) funded under PRTLI Cycle 4, came together to present their research in the Science Gallery at Trinity College. The Annual Meeting coincided with the tercentenary of the foundation of the Trinity College Dublin School of Medicine and formed part of the year-long celebrations. (See Page 21)

Inaugural DCCR Scientific Meeting

The DCCR held its inaugural Scientific Meeting in October 2011 which showcased the broad range of clinical research studies being undertaken in the DCCR network. The meeting featured presentations from four DCCR disease groups working in the areas of neuropsychiatry, respirology, prostate cancer and stroke, as well as from young investigators competing for the DCCR Young Investigator Award. Professor Barry Coller of Rockefeller University Medical School gave a very stimulating keynote address on the development of the anti-clotting drug Abciximab. (See Page 34)

MMI/ICRIN Courses and Workshops

MMI and its business unit, ICRIN, delivered a successful and innovative collaborative education and training programme in 2011 comprising a number of courses, seminars and workshops, some with continuing professional development accreditation. Workshops included: ‘Insights into Successful Translational Research’ (see Page 37), ‘EU Clinical Research Funding’ (see Page 26), ‘Research Ethics Administration for the 21st Century’ (see Page 26), ‘Health Technology Assessments for Medical Devices’ (see Page 25) and ‘Introduction to Data Analysis’ (see Page 23). In collaboration with Pfizer, MMI ran ‘Molecules to Medicines: How Biopharma Delivers’; for the sixth time (see Page 24) and ‘Techniques & Strategies in Molecular Medicine’ for the eighth time (see Page 23).

ICRIN continued to provide the only publically accessible one-day Good Clinical Practice (GCP) training course. By the end of 2011, almost 350 clinical researchers had participated in ICRIN’s GCP courses and the demand for places remains high. (See Page 27)
It was my pleasure to be appointed Chairman of MMI in January 2011 and to continue the work of my predecessor, Dr Damian O’Connell, to advance the agenda of collaborative research and post graduate education among the MMI partners.

Despite the many challenges facing the economy, the higher education sector and MMI, good progress was made in 2011 with the mission of MMI, which is to mobilise the strengths of the partner institutions and their associated hospitals to build a sustainable national system to coordinate, support and promote translational and clinical research.

With funding awarded to MMI, NUI Galway, Trinity College, University College Cork and University College Dublin under the Programme for Research in Third Level Institutions - Cycle 5, MMI put in place an innovative four year PhD programme, involving academic, clinical and industry engagement. The MMI Clinical & Translational Research Scholars Programme (CTRSP) is a unique cross-institutional programme to develop graduates with knowledge and skills to pursue disease-focused research and bridge gaps between basic scientists, clinical scientists and industry.

In March 2011, MMI invited applications for this prestigious four-year PhD programme and 20 graduates of the highest quality were recruited to the programme. We were delighted that Sean Sherlock TD, Minister of State at the Department of Jobs, Enterprise and Innovation with special responsibility for Research and Innovation, kindly agreed to launch the MMI Clinical and Translational Scholars Programme on Monday 10 October and to meet with the scholars.

The MMI scholars are based in either NUI Galway, Trinity College Dublin, University College Cork or University College Dublin and during the first, structured year of the programme, have

Chairman’s Statement

The MMI partners took the initiative to establish clinical research centres as soon as funding opportunities arose under the PRTLI and awards from the Wellcome Trust and the HRB.
come together to participate in taught modules, to undertake projects in academic research labs, to experience clinical research facilities hosted by different partner institutions. Later this year, scholars will undertake a placement in industry and then select PhD projects in such areas as drug discovery, discovery/validation of biomarkers and patient-oriented research in clinical research facilities. The CTRS programme has been developed with significant involvement of industry and of the Irish Medicines Board. Industry partners include Amgen, Creganna-Tactx Medical, Merrion Pharmaceuticals, Medtronic, Opsona, and Pfizer.

The Health Research Action Plan (2009) and the Health Research Board Strategic Business Plan 2010-14 committed to ‘establish a national co-ordinating framework for clinical research facilities in Ireland specifically designed to facilitate networking and co-ordination efforts across a range of health research issues’. MMI was pleased that the HRB, at a meeting with stakeholders in February, announced its intention to invest in developing a national clinical research infrastructure, building on investments already made by it and other funders in the clinical research centres in the MMI partner institutions. MMI and its partner institutions are committed to working with the HRB to ensure the success of the initiative, which is a major advance along a road that has been well signposted by MMI.

The MMI partners took the initiative to establish clinical research centres as soon as funding opportunities arose under the PRTLI and awards from the Wellcome Trust and the HRB. In 2006, the MMI partners established the Irish Clinical Research Network (ICRIN) with support from the HRB and HSE to undertake the preparatory work for a clinical research infrastructure based on the partner CRCs and to enable Ireland to participate as a partner in the creation of the European Clinical Research Network (ECRIN). MMI’s Clinical Research Roadmap, published in 2010, provides a blueprint for a national clinical research infrastructure. Through the creation and operation of the Dublin Centre for Clinical Research, MMI partners have gained invaluable experience in managing a clinical research infrastructure.

In response to the proposed HRB initiative, the MMI partner institutions confirmed their view that the governance and coordination of an infrastructure involving their clinical research centres and directors should be through MMI. On that basis, MMI nominated Professor Frank Giles, NUI Galway and Trinity College, to be the Principal Applicant and first Clinical Director of the infrastructure and much work was done by the directors of the clinical research centres and the staff of MMI in preparing an application in anticipation of an open call from the HRB, followed by international peer review of that application. It is disappointing to record that at the end of 2011, no call had issued and that despite the view of the MMI partner institutions, the HRB is unwilling to agree to a role for MMI in the governance and coordination of the proposed infrastructure.

I would like to take this opportunity to thank the Directors of MMI for their commitment to the mission of MMI and to their support during my first year in office. In particular, I would like to acknowledge the contribution to MMI of Professor Hannah McGee, Dr Marina Zvartau-Hind and Dr David Lloyd who stepped down as Directors during the year. I would like to welcome Professor John Kelly and Professor Vinny McCabe who joined the Board as directors during 2011 and Professor Mike Clarke of Queen’s University who joined as an observer. May I also thank the staff of MMI for their support and hard work throughout the year and for their dedication to the values of collaboration, innovation and quality that are at the heart of MMI’s strategy.

Thomas Lynch
Chairman
During 2011, MMI made considerable progress with its mission by networking together the clinical research facilities and personnel of the partner institutions.

Through Dublin Centre for Clinical Research (DCCR), MMI is supporting a clinical research infrastructure in Dublin that connects the partners’ clinical research centres to conduct multi-centre clinical studies supported by specialist research groups. In 2011, 13 studies were conducted in the network with 680 patients recruited. The results of DCCR associated studies were reported in 18 publications in leading scientific journals. A clinical studies management system was adopted across the network, a standard form for research ethics approval was also adopted and a clinical informatics platform was piloted. In addition, the first clinical trial of a medical device got underway and construction work began on the Wellcome Trust/HRB clinical research facility for Trinity College in St James’s Hospital, to be completed by the end of 2012.

Nationally, MMI worked with those engaged in clinical research in all our partner institutions to build capacity for multi-centre clinical studies. Much progress was made by MMI’s ICRIN team during the year to agree standard operating procedures for multi-centre studies, in developing a costing model for clinical studies, in delivering training in good clinical practice to 112 personnel engaged in clinical research and in promoting a more streamlined approach to patient information and consent. MMI supported an initiative to agree a standard form for applications to research ethics committees for the approval of studies other than those of medicinal products. This initiative bore fruit with the adoption by 30 committees of the standard form.

The standard form has greatly simplified the process of applying for approval of multi-site studies. Feedback from some research ethics committees suggests that it has also improved the quality of applications. New standard operating processes for multi-centre clinical trials and flow diagrams for navigating the regulatory environment for drug
clinical trials were drafted by MMI’s ICRIN team and agreed with the clinical research community. The processes and flow diagrams were made available on the MMI website for easy access by all involved in clinical trials in Ireland. There were over 100 engagements by Fionnuala Gibbons, MMI’s Clinical Trial Liaison Manager, with clinicians, SMEs and stakeholders to facilitate medical device and diagnostic studies.

During the year, MMI engaged constructively on behalf of the Irish research community with two emerging European research infrastructures - the European Clinical Research Infrastructure Network (ECRIN) and the Biobanking and Biomolecular Resources Infrastructure (BBMRI). MMI was delighted that thanks to its engagement with ECRIN, Professor Brian Lawlor, Consultant in Old Age Psychiatry, St James’s Hospital and TCD, was successful in securing €6m under the EU’s Seventh Framework Programme for a multi-national clinical trial into the prevention and treatment of Alzheimer disease. The research project, known as NILVAD and involving 25 investigator sites in nine EU countries, is the largest investigator-led clinical trial in Alzheimer disease ever conducted in Europe and positions TCD, St James’s Hospital and the Mercer’s Institute for Successful Ageing as leaders in Alzheimer research in Europe. The input of Siobhan Gaynor, the Irish European Correspondent of ECRIN based in MMI, to the development of the proposal was a critical factor in the success of the application.

MMI welcomed the commitment of the Department of Health and the HRB in 2011 to future Irish membership of the next phase of ECRIN and BBMRI, as they are established as permanent, European legal entities. However, MMI believes that Ireland should commit now to membership of these important pillars of the European Research Area and Innovation Europe. Early membership will ensure that the Irish research community is not disadvantaged in competing for European funding for clinical trials and that Ireland plays a full part in building the European infrastructure for translational and clinical research.

In November 2011 the Board of MMI adopted a strategy for the three years 2012 to 2014. The strategy recognises the challenges facing the national finances and public expenditure in higher education and the health services, in particular. Against this difficult background, the key strategic objectives of the company are to provide the governance and coordination of the proposed clinical research framework initiative announced by the HRB in April 2011 and to secure additional funding for MMI collaborative research initiatives.

I would like to thank Marie Mellody, who left MMI during the year, for her contribution to building capacity for multi-centre clinical studies and trials. We were very pleased to welcome Dr Suzanne Bracken and Susan Lennon to MMI in 2011. They took up the respective roles of Project Officer for Translational Research and ICRIN Clinical Trials Manager / ECRIN Correspondent.

In November, I informed the Board that I would not be seeking an extension of my contract beyond its expiry in September 2012. As this is my last annual report, I would like to take the opportunity to thank the three Chairmen with whom I have worked - Dr Mike Kamarck, Dr Damian O’Connell and Tom Lynch - for their support and encouragement during my time as Chief Executive. I am grateful to the Directors of the Board and in particular to those who served as members of the Executive Management Team for their advice and guidance. In particular, I would like to express my appreciation and admiration of the staff of MMI who, with great skill, professionalism and resilience, have expanded the nature and scope of collaboration in translational and clinical research and education between the partner institutions. They are among the most innovative people with whom I have ever had the pleasure to work.

Dr Ruth Barrington
CEO
Molecular Medicine Ireland (MMI) is a collaborative biomedical research partnership between National University of Ireland Galway (NUI Galway), Trinity College Dublin (TCD), University College Cork (UCC), University College Dublin (UCD) and The Royal College of Surgeons in Ireland (RCSI). MMI, established in 2008, replaced the Dublin Molecular Medicine Centre.

MMI was established in response to the need to create in Ireland a critical mass of excellence in molecular medicine research and education and to deploy a clinical research infrastructure to facilitate the transfer of advances in molecular medicine into new and more effective diagnostics, therapies and devices for patients. MMI is committed to supporting translational and clinical research, best described as research from ‘bench to bedside’ - ‘bench’ experiments being driven by clinical questions and findings at the ‘bench’ being put into practice through better diagnosis and treatment at ‘the bedside’ of the patient.

MMI is a joint venture company controlled by NUI Galway, TCD, UCC, UCD and RCSI and established with funding from the Higher Education Authority’s Programme for Research in Third Level Institutions, Cycle 4. Formally incorporated in 2008, MMI is a company limited by guarantee and has been registered without the world ‘Limited’ in its name. It is a registered charity founded for the promotion of molecular medicine research. MMI is governed by a Board of Directors (see page 13) supported by an Executive Management Team (EMT: see page 11) The EMT comprises the CEO of MMI and five directors who are leaders in medical research in the partner institutions. MMI appointed an Observer for Queen’s University, Belfast to the Board for the first time.

At the end of 2011, the business of MMI was supported by a staff of 11 people, of whom 6.5 were funded from sources other than by the partner institutions. Two FAS JobBridge interns joined MMI in December; one assisting the Education and Training team and the other the ICRIN team.

MMI has been successful in attracting funding from the Health Research Board, the Health Service Executive, European Union and Enterprise Ireland to develop clinical research capacity in Ireland. The organisational structure of MMI is shown in the diagram below and the names of the members of staff are listed on page 45. Staff work closely with senior investigators in the partner institutions and associated hospitals to put MMI programmes into effect, including the Clinical and Translational Research Scholars Programme, MMI’s suite of courses and workshops, the deployment of the Dublin Centre for Clinical Research, building capacity for multi-centre clinical studies through ICRIN and MMI’s support for biobanking, biomarker development and technology platforms.
MMI Strategy

In December 2008, MMI adopted a strategy to guide its direction and activities to the end of 2011. The strategic vision of MMI is improved healthcare through the development of diagnostics and therapies from concept to realisation.

The strategic mission of MMI is to mobilise the strengths of the five partner institutions and their associated hospitals to build a sustainable national system to coordinate, support and promote translational and clinical research.

MMI achieves this mission by:

- connecting the key players in health, research and industry
- attracting, training and retaining world-class researchers
- working to provide state-of-the-art facilities, bio-resources and harmonised processes
- representing Ireland in clinical and translational research infrastructures/networks in Europe and internationally, and building collaborative research initiatives and opportunities.

MMI’s unique selling point is its potential to mobilise the strengths of the partner institutions and their associated hospitals to build a national system for clinical and translational research. This national system is necessary to translate research into innovative diagnostics, therapies and devices that will improve the health of the population, contribute to economic development and create employment. A national system for clinical and translational research is a virtuous circle for innovation. The same system can serve the needs of academic researchers, industry-led research and those SMEs and start-ups that need access to clinical resources to bring their prototypes to market. MMI’s greatest contribution to innovation over the next few years will be to integrate the capacity and expertise of the partner institutions and associated hospitals to complete this national system and make it accessible to all who need access to clinical resources.

A focus on building a national system for clinical research maps well with the Health Research Action Plan’s deliverable of ‘fully functional and networked clinical research facilities in our main academic teaching hospitals, with a focus on accelerating research advances into benefits for patients and the population’.

The output of MMI’s activities are:

- the deployment of a sustainable system for clinical and translational research to support trans-disease, multi-site studies nationally and as part of the European Clinical Research Infrastructures Network (ECRIN)
- the creation of an internationally recognised community in molecular medicine and clinical research
- the creation of skilled translational and clinical researchers, both medical graduates and scientists
- the creation of high quality and standardised biological collections for patient and disease-focused research linked with the European Biobanking and Biomolecular Resources Infrastructure (BBMRI)
- the generation of new intellectual property to fuel Ireland’s biotechnology, biomedical device and pharmaceutical industry
- new diagnostics, devices and therapeutics and more effective patient intervention strategies.
The Executive Management Team (EMT) guides the scientific and operational strategy of MMI and comprises five MMI Board Directors, one each from NUI Galway, RCSI, TCD, UCC and UCD and the Chief Executive Officer of MMI.

**Professor Larry Egan**

Professor of Clinical Pharmacology, Head of the Department of Pharmacology and Therapeutics at NUI Galway and Consultant Clinical Pharmacologist with the HSE Western Region

Larry Egan took up his appointment with NUI Galway and the HSE in 2005 after having gained specialist experience in the USA in the areas of gastroenterology, internal medicine and clinical pharmacology and gastroenterology at the Mayo Clinic in Minnesota (1994-1999) and in the Laboratory of Mucosal Immunology at the University of California in San Diego. Currently, his research focuses on molecular characterisation of signalling pathways involved in intestinal epithelial cell stress, death and malignant transformation.

**Professor David Kerins**

Associate Professor of Therapeutics at University College Cork, Consultant Physician at Mercy University Hospital, Dean of the Medical School of UCC and Vice-Head of the College of Medicine and Health

David Kerins’ current positions at UCC and MUH were preceded by appointments in the USA at the Vanderbilt University Medical Center, at Nashville Veterans Affairs as Associate Professor of Medicine and Chief of the Cardiology Section, and at the Cardiovascular Magnetic Resonance Center, Beth Israel Deaconess Medical Center, Harvard Medical School as Visiting Scientist. Professor Kerins current research interests include the assessment of the role of platelet activation and of antithrombotic strategies in the setting of cardiovascular disease, including high risk conditions such as the metabolic syndrome and diabetes mellitus.

**Professor Dermot Kelleher**

Vice-Provost for Medical Affairs, Head of the School of Medicine & Director of the Institute of Molecular Medicine, Trinity College Dublin & St James’s Hospital

Dermot Kelleher was appointed Wellcome Senior Fellow in Clinical Science in 1989 at Trinity College Dublin and subsequently Professor of Clinical Medicine in 2001. With specialist training in Gastroenterology, Professor Kelleher’s widely published research has focused on the cell biology both of immune responses and of the inflammation-cancer sequence. In 2002 he co-founded MMI’s predecessor, the Dublin Molecular Medicine Centre, and was Principal Applicant in the successful applications for funding from the Wellcome Trust and Health Research Board to establish the Dublin Centre for Clinical Research.
**Professor Gerry McElvaney**

Professor of Medicine, Chairman of the Department of Medicine, Royal College of Surgeons in Ireland and Director of the Respiratory Research Unit, Beaumont Hospital

Gerry McElvaney has a strong track record in translational research both in Ireland and the USA in the areas of Cystic Fibrosis, emphysema and lung inflammation with an emphasis on protease/anti-protease interactions, signal transduction in bronchial epithelium, innate defences of the lung and gene therapy for lung diseases. He co-founded the Respiratory Research Unit in Beaumont Hospital in 1997 and the Alpha One Foundation of Ireland in 2003, both of which have attracted significant national and international funding and have resulted in a large number of publications as well as interactions with pharmaceutical companies interested in translational research.

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**Professor Bill Powderly**

Head of School of Medicine & Medical Science and Professor of Medicine & Therapeutics at University College Dublin and the Mater Misericordiae University Hospital and Chief Academic Officer of Dublin Academic Health Care

Bill Powderly has been actively involved in HIV-related research in both Ireland and the USA and is widely published in this area. His recent research focuses on the emerging toxicities of treatment of HIV, especially the metabolic complications seen in patients receiving effective therapy, including the development of diabetes, lipid abnormalities and bone disease. Professor Powderly is a Fellow of the Infectious Diseases Society of America, the Royal College of Physicians of Ireland and the American Association for the Advancement of Science.

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**Dr Ruth Barrington**

Chief Executive of Molecular Medicine Ireland

Dr Ruth Barrington was appointed Chief Executive to the DMMC (now MMI) in October 2007. She was awarded a PhD from the London School of Economics and an honorary degree in laws by NUI Maynooth, and she is the author of Health, Medicine and Politics in Ireland, 1900-1970 and other publications on health, research policy and EU affairs. She was Chief Executive of the Health Research Board from 1998 to 2007. She is on the board of IPPOSI (Irish Platform for Patients’ Organisations, Science and Industry), the Conway Institute (UCD) and CRANN (TCD) and she is Chair of the Irish Times Trust.
MMI Board of Directors

Thomas Lynch
CHAIR

Professor John Kelly
Director of Research, Royal College of Surgeons in Ireland

Professor Willard Dere
Senior Vice-President and International Chief Medical Officer of Amgen

Professor Gerry McElvaney
Professor of Medicine, Royal College of Surgeons in Ireland

Dr Helen Ryan
Chief Executive, Creganna

Larry Egan
Chair of Clinical Pharmacology and Head of the Department of Pharmacology and Therapeutics, NUI Galway

Professor Tim O’Brien
Professor of Medicine and Director of the Regenerative Medical Institute, NUI Galway

Professor Jonathan Hourihane
Head of Department of Paediatrics, University College Cork

Professor Bill Powderly
Head of the School of Medicine & Medical Science and Professor of Medicine & Therapeutics at University College Dublin and the Mater Misericordiae University Hospital

Professor Anita Maguire
Vice-President for Research & Innovation, University College Cork

Mr David Shanahan
Global Head of Life Science, IDA

Professor Dermod Kelleher
Professor of Clinical Medicine and Head of the School of Medicine, Trinity College Dublin and Director of the Institute of Molecular Medicine, Trinity College Dublin and St James’s Hospital

Professor Vinny Cahill
Dean of Research & Head of Department of Computer Science, Trinity College Dublin

Mr John Coman
Corporate & Legal Affairs Secretary, University College Dublin

Professor Michael Keane
Professor of Medicine and Therapeutics and Consultant Respiratory Physician at St Vincent’s University Hospital

Professor Mike Clarke,
Observer for Queens University Belfast. Chair of Research Methodology at Queen’s University Belfast and Director of the All-Ireland Hub for Trials Methodology Research

Dr Marina Zvartau-Hind
Director Neurosciences Medicines Development Centre and Clinical Leader of Alzheimer Disease Projects, GlaxoSmithKline

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MMI Board Appointments

Professor Anita Maguire
Professor Anita Maguire, Vice-President for Research & Innovation, Professor of Pharmaceutical Chemistry and Director of the Analytical & Biological Chemistry Research Facility at University College Cork became a Director of the MMI Board in April 2011. Professor Maguire was recently appointed Chair of the Irish Research Council for Science, Engineering and Technology (IRCSET) and holds positions on a number of state boards. She is Adjunct Professor in Chemistry at the University of Bergen in Norway and has served on many review boards including the Research Council of Norway.

Professor Maguire’s research interests focus on synthetic organic chemistry and pharmaceutical chemistry including novel synthetic methodology, asymmetric synthesis, the design and synthesis of bioactive compounds with pharmaceutical applications and crystal engineering.

Professor Vinny Cahill
Professor Vinny Cahill joined the MMI Board of Directors in September 2011. Professor Cahill is Dean of Research at Trinity College Dublin where he has responsibility for coordinating the university’s research, innovation, technology transfer and entrepreneurship strategies.

Professor Cahill has previously served as Head of the Department of Computer Science, Director of Research for Computer Science and Statistics, Director of Teaching and Learning (Postgraduate) for Computer Science and Statistics, Head of the Distributed Systems Group, and Course Director for the M.Sc. in Computer Science and Statistics, Head of the Distributed Systems Group, and Course Director for the M.Sc. in Computer Science (Networks and Distributed Systems) and the M.Sc. in Computer Science (Mobile and Ubiquitous Computing).

He is an SFI Principal Investigator and Co-Investigator of Lero – The Irish Software Engineering Research Centre.

Professor John Kelly
Professor John Kelly was appointed to the Board of MMI in November 2011. Professor Kelly has extensive experience in academia, industry and regulatory affairs. Originating from an academic teaching and research background at Queen’s University, Belfast and the Royal College of Surgeons in Ireland, he spent ten years in pharmaceutical industry research and development and was Head of Research and Chief Scientific Officer at Elan Corporation.

Subsequently, he became the founding Chief Executive of the Irish Medicines Board, the successor body to the National Drugs Advisory Board.

In 2001, he established the School of Pharmacy at RCSI, at that time the second school of pharmacy to be established in the Irish State. He was Head of School until 2010 and took over as Director of Research at RCSI earlier this year.

Professor Mike Clarke
Professor Mike Clarke was appointed Observer for Queen’s University Belfast to the Board of Molecular Medicine Ireland in November 2011.

He is Director of the All-Ireland Hub for Trials Methodology Research and Chair of Research Methodology at Queen’s University in Belfast, having moved to this new position in March 2011 after nearly a decade as Director of the UK Cochrane Centre.

He is also the current Chair of the UK-wide MRC Network of Hubs for Trials Methodology Research.

Professor Clarke is Podcast and Journal Club Editor for The Cochrane Library, and has a strong interest in strengthening the methods and capacity for the conduct of systematic reviews and randomised trials, and in improving their accessibility, in particular in resource poor settings.
MMI Partner Research Institutes

NUI Galway, Regenerative Medicine Institute

The Regenerative Medicine Institute (REMedI) was established at NUI Galway in 2004 as a Science Foundation Ireland funded Centre for Science, Engineering and Technology with a central focus on the development of novel therapies for treating major human diseases involving adult stem cell therapy and gene therapy.

It has developed a translational research effort with an emphasis on the delivery of therapeutic products to patients and is an integral part of the National Centre for Biomedical Engineering Science. It consists of a large multidisciplinary team of scientists, clinicians, engineers, technicians and veterinarians lead by Professor Tim O’Brien (Director) and Professor Frank Barry.

REMedI has significant interest in addressing diseases of the vasculature and to this end, is currently looking at stents as a platform from which to deliver a therapeutic product to blood vessels.

www.nuig.ie/remedi/

RCSI Research Institute

The RCSI Research Institute is a multi-site infrastructure encompassing the research activities of RCSI at the St Stephen’s Green campus and the RCSI Education and Research Centre (ERC) at Beaumont Hospital. This comprises a network of research centres and core facilities in peptide synthesis and labeling, solid phase chemistry, proteomics, clinical research and biobanking, molecular, live cellular and human imaging.

Through this infrastructure of laboratories, core technology platforms and staff, the RCSI Research Institute aims to facilitate and develop sustainable research programmes in translational research in the areas of Neuroscience, Cancer Cell Biology and Genetics, Vascular Biology, Imaging and Molecular Medicine, Population Health, Bio-Engineering, Infection and Immunity.

The Clinical Research Centre (CRC) at Beaumont Hospital, which combines dedicated research beds and laboratories equipped for cell and molecular biology, enables an integrated bench-to-bedside approach to biomedical research.

www.rcsi.ie/research

TCD Institute of Molecular Medicine

The Institute of Molecular Medicine (IMM) was established in 2003 as a state-of-the-art facility housed in a 4,500 sq metre building within the Trinity Centre for Health Sciences at St James’s Hospital. IMM is primarily designed as a molecular research facility. To date, IMM has been successful in bringing key research groups into a single location promoting interdisciplinary and complementary synergies.

IMM is a facility dedicated to research into the molecular basis of human disease with significant core technology platforms in: High Content Screening Analysis in association with the siRNA Library, Cell Signalling, High Throughput Genomics, Transcriptomics and houses the Irish Gene Bank. IMM’s key research themes are: Infection & Immunity, Cancer and Neurosciences. IMM offers structured postgraduate education programmes in Molecular Medicine at Diploma, MSc, and PhD level, the latter a prestigious Health Research Board funded 4-year PhD scheme.
MMI Partner Institutes (Cont’d)

IMM’s location on the St. James’s Hospital site permits close interaction between basic and clinical sciences promoting the bench to bedside approach in molecular medicine. IMM has strategically targeted the aggregation of research teams within the institute, and as a result, an excellent pool of academic researchers, clinician scientists, technologists and teaching resources has been assembled and aligned around a molecular level approach to medicine. Currently, IMM houses approximately 180 residents in 16 research teams. www.tcd.ie/IMM

UCD Conway Institute of Biomolecular & Biomedical Research

The UCD Conway Institute of Biomolecular & Biomedical Research is located on the Belfield campus of University College Dublin, the largest university in Ireland. This multidisciplinary centre for research brings together over 550 research staff from all over the University and its associated teaching hospitals.

The research focus of UCD Conway Institute is the identification of molecular mechanisms underlying human and animal diseases primarily in the areas of Infection, Immunity & Repair; Diabetes & Vascular Biology and Neuroscience. The close collaboration of scientists and clinicians underpins the translational nature of this research from the ‘bench to bedside’ which is supported by world-class proteomic, bioinformatic and transcriptomic core facilities.

The longer term objectives of the Institute are set on the integration of the biological sciences with those sciences not traditionally associated with biology with a view to realising the synergistic benefits of such associations. These include computer science, applied mathematics, systems biology, engineering and economics. www.ucd.ie/conway

UCC BioSciences Institute

Basic and translational research at UCC has been greatly enhanced by the opening, in 2002, of the Biosciences Institute (BSI). The BSI provides research space for active investigators in the biomedical area and fosters, through its design and governance, a collaborative and interdisciplinary approach to research questions.

The Institute incorporates six major research programmes, including Neuroscience, Cancer Biology, Cell Signalling and Cardiovascular Health, Plant Biotechnology and Integrative Genomics, Food for Health and Microbe Host Interaction. The BSI houses over 250 scientists from eight different departments, as well as three research centres (APC, CCRC and BIOMERIT). Technology platforms at the BSI include functional genomics, proteomics, bioinformatics, advanced microscopy, cell imaging and transgenics. In addition, BSI is also home to a number of state-of-the-art core facilities such as the Advanced Microscopy Unit, MALDI-TOF (mass spectrometry) and Flow Cytometry. The major unifying theme of the BSI is the improvement of quality of life for patients, while the underlying strategy that ties all research groups together is teamwork. Adjacent to the BSI, and directly linked to it, the School of Pharmacy incorporates a designated industry suite to allow transfer of new pharmaceuticals to industry. www.bsi.ucc.ie
MMI Partner Clinical Research Facilities

HRB Clinical Research Facility, Galway
The HRB Clinical Research Facility, Galway (CRFG) is a joint venture funded by the Health Research Board between Galway University Hospitals (GUH) and National University of Ireland, Galway (NUIG) and opened in temporary accommodation in March 2008. The CRFG provides the infrastructure, physical space, facilities, expertise and culture needed to optimally support patient-focused research studies and clinical studies aimed at understanding a range of diseases and translating the knowledge obtained through this research work into reimbursed, regulatory approved advances in patient care as speedily as possible. The Department of Health has provided the Health Research Board with €7.5 million to fund the construction of a new building which is expected to commence in July 2011. This will provide Galway with world class facilities for researchers and industry and will enhance research development capacity in the medical device and pharmaceutical sectors. The CRFG will be built along with translational research laboratories which will provide facilities for processing and analysis of biospecimens.

HRB Discovery Centre, Cork
The HRB Discovery Centre is a paediatric clinical research facility based in Cork University Campus which opened in November. The HRB will provide funding of €58,000 to the new paediatric CRF which will conduct clinical assessments on more than 2000 babies and children over the next six years. One of the research programmes being conducted at the new facility is BASELINE. As Ireland’s first study to observe children from before birth up to two years of age, it will examine the development of allergies, metabolic problems, diabetes and neurodevelopmental problems. The facility will also be the Irish central point for the development of an international study called NEMO, which aims to understand the effects of hypotension on the foetus. The HRB Discovery Centre is part of a much bigger HRB clinical research facility and research programme currently being developed by UCC, Cork University Hospital and Mercy University Hospital and both centres will be part of a national research network supported by the HRB. The CRF which is undergoing development and due to open in September 2011 will facilitate and promote high quality clinical research of an international standard.

UCD Clinical Research Centre
The UCD Clinical Research Centre is an academic-led integrated clinical research infrastructure located at the Mater Misericordiae University Hospital and St. Vincent’s University Hospital and which supports activity at several other Dublin hospitals. Purpose-built clinical investigation and laboratory support facilities were established in April 2006 at Mater and in 2007 at St Vincent’s with recurrent funding from PRTLI Cycle 3. Since opening in April 2006, there have been over 18,000 research patient visits in core areas of clinical trials, population studies and mechanisms of disease based research. As well as providing the infrastructure for development of improved healthcare practice, the UCD CRC is also enhancing access to health services and new medicines. In addition to underpinning research, there is a substantial benefit to both the patient and the hospitals from rapid and early access to modern healthcare. The UCD CRC has enabled Dublin Academic Medical Centre (DAMC) investigators to leverage over €12M in research funding comprising industry-funded clinical trial activity and competitive peer-reviewed research funding from charitable and public funding agencies. The UCD CRC is an active participant in the MMI coordinated Dublin Centre for Clinical Research.

RCSI Clinical Research Centre
2010 marked the 10-year anniversary of the opening of the RCSI Clinical Research Centre. In that time the CRC has grown significantly and now has a core staff of 15 research nurses in addition to administrative, medical and IT personnel. In the last decade, more than 13,000 patients have participated in clinical trials. Research activities at the centre span the research spectrum from patient registries, biobanking projects, and observational studies to device trials and clinical trials of medicinal products. RCSI nursing personnel play significant operational roles in the DCCR and ICRIN working groups, as well as contributing to the ongoing development of the Irish Research Nurses Network. In partnership with the DCCR they are engaged in a number of collaborative disease group studies in the areas of respiratory, gastrointestinal, neurology and endocrinology, and have contributed to the development of research protocols. The RCSI CRC also has a leading role in the provision of educational courses and support for the professional development of clinical research nurses. The first ever Postgraduate Certificate in Nursing (Clinical Research), provided through the RCSI Faculty of Nursing and Midwifery, is in its second year.

Centre for Advanced Medical Imaging
The Centre for Advanced Medical Imaging (CAMI) at St James’s Hospital (TCD) was funded by the Health Research Board and opened in the Autumn of 2008. CAMI, which is a national centre open to researchers from other institutions, focuses on three research themes:
1. Cardiovascular imaging techniques that allow visualisation of the vascular tree and assessment of heart function and the viability of heart tissue.
2. Brain MRI imaging techniques that help understand and assess conditions such as stroke, epilepsy, depression and multiple sclerosis.
3. Whole body screening of patients with cancer through new methods that identify abnormal water diffusion in tumours. Prostate and breast imaging in particular have potential to benefit from MRI developments.
CAMI is located close to where the planned Wellcome Trust and HRB Clinical Research Centre and TCD’s Institute of Cardiovascular Science will be built.
Molecular Medicine Ireland builds innovative and successful collaborative education and training programmes and resources in clinical and translational research by combining the strengths of five partner academic institutions, by developing key external partnerships to support activities, and by ensuring wide cross-institutional access through well-established communication channels.

MMI Education & Training targets three strategic areas, which have shown considerable progress in 2011.

**Structured PhD Programmes**

MMI coordinates two major national collaborative structured PhD programmes, funded through the Irish Government’s Programme for Research in Third Level Institutions (PRTLI).

From 2008, the Clinician Scientist Fellowship Programme (CSFP) is training 22 medical graduates based in five Medical Schools. In 2011, the third MMI Clinician Scientist Annual Scientific Meeting provided a vibrant snapshot of medical research in Ireland and there were notable national and international research successes for MMI Fellows.

This year, the first cohort of 20 basic science graduates began their studies in the new MMI Clinical & Translational Research Scholars Programme (CTRSP). A milestone launch event in October was preceded by development of a unique 4-year PhD experience incorporating a first year of short courses and research placements in four universities and industry partners.

**Shared Curricula for Graduate Research Training**

A centrally-managed website resource hosts shared curricula developed by the MMI partner institutions. Graduate education modules taking place in each partner institution – components of existing Masters and PhD programmes – are aligned to curriculum topics, providing unique national portfolios of structured training to support identified cohorts of graduate students.

The first shared curriculum, developed for clinician scientist trainees by the MMI partner Medical Schools, enables access to over 60 graduate education modules taking place in five academic institutions.

**Continuing Professional Development Courses**

MMI Courses & Workshops are a well-established feature of national research training for graduate students and postdoctoral staff, beginning in 2003 through PRTLI Cycle 3 funding. The courses and workshops, which have been mainstreamed by MMI and the partner institutions with the support of commercial sponsorship, are developed and delivered by faculty from multiple institutions, including international keynote speakers and industry staff.

In 2011, MMI offered the sixth run of our collaboration with Pfizer, ‘Molecules to Medicines: How Biopharma Delivers’; a new ‘Introduction to Data Analysis’ workshop; and ‘Techniques & Strategies in Molecular Medicine’.
An exciting new structured PhD programme that prepares science graduates for jobs in Ireland’s knowledge economy was launched on 10 October 2011 by Minister Sean Sherlock TD, Minister of State with special responsibility for Research and Innovation.

The Clinical and Translational Research Scholars Programme (CTRSP) was developed by Molecular Medicine Ireland and its academic partners, NUI Galway, TCD, UCC and UCD, and was awarded funding of €4.3m under PRTLI Cycle 5. The CTRSP benefits from the extensive involvement of industry partners, including Amgen and Creganna-Tactx Medical, as well as the Irish Medicines Board.

Minister Sherlock commented on the critical need to translate research discoveries into commercial outputs, and in that regard he commended Molecular Medicine Ireland and all involved in this initiative.

Other speakers were Professor Laurence Egan (Department of Clinical Pharmacology at NUI Galway, a director of MMI and the Principal Investigator on the CTRSP application) and Dr Patrick Gammell (Pfizer, Ireland). Four of the new MMI Scholars spoke at the launch, giving their views on why they were attracted to the CTRSP and their thoughts on future career plans.
The CTRSP is a four year structured PhD programme, which will train scholars to translate patient and disease-focused research into clinically effective and commercial applications. These are skills required by knowledge industries in the health sector and in start-up companies. Twenty science graduates have enrolled on the programme following a competitive selection process – five each based in NUI Galway, TCD, UCC and UCD.

During the first year, the scholars have the opportunity to attend each of the four participating institutions for taught modules. The first year also includes placements in academic research groups, clinical research centres and in industry.

The CTRSP will address the deficit in the number of scientists in Ireland undertaking innovative patient and disease-focused research with a key understanding of how to translate research findings to the clinic.

The CTRSP combines collaborative teaching, research and clinical expertise of academic medical centres, industry, and the Irish Medicines Board in a structured PhD programme that provides graduates with research training of the highest quality and an in-depth understanding of the clinical, commercial and regulatory environment essential for effective careers in healthcare research.

Minister Sean Sherlock speaking at the CTRSP launch; Prof. Larry Egan (NUI Galway), Minister Sherlock, Dr Ruth Barrington (MMI), Dr Patrick Gammell (Pfizer Ireland); Dr Gammell speaking at the launch.

The MMI Clinical & Translational Research Scholars Programme is funded under the Programme for Research in Third Level Institutions (PRTLI) Cycle 5, and co-funded under the European Regional Development Fund (ERDF).
Clinician Scientist Fellowship Programme

Twenty two medical graduates are pursuing or have recently completed PhDs in five academic institutions (NUi Galway, RCSI, TCD, UCC and UCD) as part of the MMI Clinician Scientist Fellowship Programme (CSFP), funded through PRTLI Cycle 4.

MMI Clinician Scientist Annual Meeting 2011

MMI Fellows gathered alongside other clinician scientist trainees on 1 July 2011 to present their research in the stimulating surroundings of the Science Gallery, Trinity College Dublin.

Professor Michael Gill (Professor of Psychiatry, TCD) opened the 3rd Annual MMI Clinician Scientist Meeting, which this year was part of the celebrations of the tercentenary of the foundation of the TCD School of Medicine. The meeting format comprised four sessions containing 14 oral research presentations by MMI Clinician Scientist Fellows, with each session chaired by an MMI Fellow. There were also opportunities to view 19 posters submitted by other medical graduates undertaking PhD studies in the MMI partner institutions, including HRB-funded Fellows. Over 70 people attended the meeting.

Professor Dermot Kelleher (Vice-Provost of Medical Affairs, Head of the TCD School of Medicine and MMI Director) awarded prizes for oral and poster presentations. The Annual Meeting concluded with an excellent keynote address given by Professor Garret FitzGerald (Professor of Medicine & Pharmacology at the University of Pennsylvania and Director of the Institute for Translational Medicine & Therapeutics).
Clinician Scientist Fellowship Programme (Cont’d)

Notable achievements by MMI Clinician Scientist Fellows in 2011 included:

Dr John O’Sullivan (UCC) won the Young Investigator Award at the American College of Cardiology Meeting, New Orleans.

Dr Sanjay Chotirmall (RCSI) awarded the Respiratory Medicine Prize by the Royal Academy of Medicine in Ireland. Dr Chotirmall was also presented with the Dublin Centre for Clinical Research Young Investigator Award.

Dr Fionnuala Ní Áinle (TCD) awarded the George Green Medal by the Faculty of Pathology, Royal College of Physicians of Ireland for most highly rated research publication.

Dr Fergus McCarthy (UCC) won the Royal College of Physicians of Ireland William Stokes Award 2011. The award supports and recognises the highest standard of research by Specialist Registrars.

Clinician Scientist Structured Postgraduate Curriculum

The first shared curriculum hosted by MMI with central coordination of access to over 60 graduate education modules aligned to curriculum topics. The modules take place in NUI Galway, RCSI, TCD, UCC and UCD.

Some of these modules are normally only accessible to graduate students registered for particular postgraduate courses. Places have been made available to MMI curriculum users at the discretion of each module coordinator.

Registered curriculum users view detailed information on each module, including dates of the next run, and contact MMI to apply to attend modules of interest.

Core Topics

- Research Skills
- Writing, Publishing & Communication Skills
- Biostatistics
- Career Management and Leadership in Academic Medicine

Optional Topics

- The Molecular Biology Behind the Disease
- Bioinformatics
- Clinical Research
- Innovation and Commercialisation of Research for Patient Benefit
- Biomarker Discovery and Validation
- Epidemiology - Research Tools to Address Public Health Issues
- Other Modules of Relevance to Clinical Investigators
- Other Relevant Techniques and Technology Modules
The first run of the MMI course ‘Introduction to Data Analysis’ took place in the TCD Institute of Molecular Medicine, St James’s Hospital, on 17-18 January 2011.

Twenty two graduate students and researchers from the MMI partner institutions (NUI Galway, RCSI, TCD, UCC and UCD) attended the course, which comprised 11 hours of lectures and lab-based practical sessions delivered by the course faculty based in TCD: Drs Eleisa Heron, Carlos Pinto and Ricardo Segurado.

At the time of inviting applications to attend the course there was a very high level of interest, with over 110 online applications in only a day and a half. Places on this course were limited but we are exploring the role of MMI in the future in addressing the evident high demand for training in statistical analysis.

Three sessions of the MMI Course ‘Techniques & Strategies in Molecular Medicine’, were re-scheduled after the eighth run of this course fell victim to adverse weather in December 2010. An audience of 60 attended the re-scheduled course, held in more favourable weather conditions at the UCD Conway Institute on 22-23 March 2011.

This has been one of the most popular MMI Courses over the last eight years, with wide-ranging talks from investigators at the forefront of developing and using biomedical research techniques and technologies.

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### MMI Courses & Workshops

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<td>Introduction to Data Analysis</td>
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<td>Techniques &amp; Strategies in Molecular Medicine*</td>
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<td>Molecules to Medicines: How Biopharma Delivers – Lecture Course (in collaboration with Pfizer)</td>
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Over the two days, participants heard lectures from 14 speakers from NUI Galway, RCSI, TCD and UCD. Topics covered included RNA interference, transgenic and gene targeting techniques, systems biology approaches, investigating protein-protein interactions, expression proteomics, fluorescent/confocal imaging, high content screening and analysis, and stem cell applications.

The first session of the course, held on 1 Dec 2010, featured lectures on RNA detection, differential gene expression, polymorphism association with disease and animal models.

In collaboration with Pfizer, MMI ran the highly popular course ‘Molecules to Medicines: How Biopharma Delivers’ for the sixth year on 22-23 November 2011. This course includes a one-day lecture programme followed by a one-day problem-solving workshop, both delivered by scientists from the Pfizer campus at Grange Castle.

The new TCD Biomedical Sciences Institute hosted the day 1 lectures, and the workshop was held at the MMI offices in Newman House. A follow-up visit to the Pfizer campus at Grange Castle was organised for a limited group of course attendees on 24 November.

Courses & Workshops (Cont’d)

Attendances breakdown for 2011 (Total=174): Institutional Affiliation

- National University of Ireland Galway: 59
- Royal College of Surgeons in Ireland: 14
- Trinity College Dublin: 22
- University College Cork: 51
- University College Dublin: 10
- Other: 18

2011 Courses Sponsors:

Agilent Technologies
Pfizer
Minitab

MMI Annual Report 2011 - Page 24
The Irish Clinical Research Infrastructure Network (ICRIN) was established in 2006 by five academic partners (NUI Galway, RCSI, TCD, UCC, UCD and MMI) to create a harmonised and coordinated clinical research infrastructure in Ireland. Such an infrastructure is essential to the conduct of multi-centre and multi-national clinical trials that enhance outcomes for patients, improve the health of the population and directly support the life science industry in Ireland. ICRIN’s activities have been funded by the Health Research Board (HRB) and the Health Service Executive (HSE).

ICRIN is also funded by Enterprise Ireland (EI) to provide services to support indigenous innovators and academics, small to medium enterprises (SMEs) and multinational companies to access clinical resources required to bring their products to market. ICRIN operates as a business unit of Molecular Medicine Ireland and is the Irish scientific partner of the European Clinical Research Infrastructure Network (ECRIN).

In 2011, ICRIN was reorganised to facilitate the merger of clinical and translational research functions. This reorganisation arose from the need for consistency and efficiency across the entire research spectrum from bench to patient therapy and reflected the deliverables of both the HRB and Enterprise Ireland where there has been an increasing emphasis on biomarkers, diagnostics, biobanking and clinical research. Siobhan Gaynor, Programme Manager for Clinical and Translational Research was appointed to lead on ICRIN’s commitment to supporting clinical and translational research nationally and at European level.
ICRIN delivered twelve clinical research workshops, seminars and training courses with attendance by over 500 health professionals

Throughout 2011, ICRIN continued to provide education and training through the organisation and delivery of seminars, workshops, lectures and Good Clinical Practice training courses. Highlights from a selection of these are detailed below.

**Workshop on EU Clinical Research Funding**

In June, ICRIN, the Health Research Board and Enterprise Ireland hosted an informative workshop in the Science Gallery of Trinity College Dublin entitled ‘EU Clinical Research Funding: Lessons learned and up-coming opportunities’. The purpose of the workshop was to provide an understanding of how successful investigators secure funding from EU framework programmes, and how ICRIN and the European Clinical Research Infrastructure Network can assist investigators in the organisation of multi-national clinical studies. The workshop also provided an opportunity to learn more about forthcoming FP7 clinical research calls and to meet face to face with national contact points for advice on how to make a successful submission. It featured a number of presentations which are available at: http://www.fp7ireland.com/Page.aspx?SP=162

**Research Ethics Administration for the 21st Century**

Also in June, MMI/ICRIN hosted a very successful seminar on the topic of a research ethics system for the 21st century. A highlight of the day was the presentation by Orla Keane of the Alpha One Society in which she described her experience as a participant in a clinical trial of a new treatment for antitrypsin deficiency. Dr Siobhan O’Sullivan, Chief Bioethics Officer in the Department of Health, chaired the first session on the standardisation of patient information and consent processes and expressed support for an initiative on this issue. Professor Jane Grimson, Director of Health Information in HIQA, and the person who will lead HIQA’s responsibilities for research ethics committees, expressed her support for incremental definition of standards and improvements by the community in both patient information and on-line applications as this would make the business of implementing HIQA standards all the easier and faster over the next few years. A summary of the proceedings of the seminar is available at http://www.molecularmedicineireland.ie/show/item/1/1641
Workshop on Health Technology Assessments for Medical Devices

A workshop on Health Technology Assessments (HTA’s) for Medical Devices was held in NCSBES Seminar Room NUI Galway in February 2011, constituting the second iteration of this workshop. Over 30 participants attended and included representatives from Enterprise Ireland and IDA client companies as well as researchers from NUI Galway. Fionnuala Gibbons, Clinical Trials Liaison Officer, opened the workshop by emphasising the importance and need for HTAs within the medical device industry. Professor Ciaran O’Neill, Professor of Economics at NUI Galway, provided an overview of HTAs and presented the different aspects for discussion, namely, cost benefit analysis, dealing with uncertainty, cost measurements and outcomes and budget impact analysis. The workshop identified a demand for greater understanding and knowledge of health economics methodologies such as economic modelling, to support the medical device industry during the development phase. To read more about this workshop please visit: http://www.molecularmedicineireland.ie/show/item/1/1593

ICRIN Good Clinical Practice Training

Throughout 2011, ICRIN continued to provide the only publically accessible, one-day Good Clinical Practice (GCP) training course. ICRIN launched its training programme in GCP in February 2009 to ensure that all those involved in the conduct of clinical trials had access to quality training, training. This is a requirement of the Irish Medicines Board for those working in investigational medicinal product trials. By the end of 2011 almost 350 clinical researchers including medical practitioners, nurses and pharmacists, had participated in ICRIN's GCP courses and the demand for places remains high.

In addition to GCP training, the ICRIN team contributed to the RCSI Certificate in Research Nursing, the NUIG Masters in Clinical Research, the UCD Postgraduate Programme in Clinical & Translational Research and the TCD Masters in Pharmaceutical Medicine. ICRIN also attended and gave presentations at a number of scientific and clinical meetings held during the year.
Professor Brian Lawlor (above), Consultant in Old Age Psychiatry, St James’s Hospital and Trinity College Dublin, was awarded €6m in 2011 by the European Union to conduct research into the prevention and treatment of Alzheimer disease. Professor Lawlor’s proposal was developed in collaboration with Siobhan Gaynor as the Irish European Correspondent of the European Clinical Research Infrastructure Network (ECRIN) based in Molecular Medicine Ireland.

The research project, which has been named NILVAD, involves the use of the drug Nilvadipine in over 500 patients with Alzheimer disease. It will be the largest investigator-led clinical trial in Alzheimer disease ever conducted in Europe and it positions Trinity College, St James’s Hospital and the Mercer’s Institute for Successful Ageing as leaders in Alzheimer research in Europe. NILVAD will facilitate the development of a network of investigators Alzheimer disease across Europe, familiarising investigators with the structure and supports required to develop investigator-led research and thereby establishing a network that can support future investigator-initiated studies in Alzheimer disease.

The NILVAD research consortium consists of 25 investigator sites in nine European countries (Ireland, UK, France, Italy, Hungary, Greece, Germany, Sweden and the Netherlands) with the potential to add countries and sites over time. There are 18 key partners that bring specific skills and functions that make the network a unique platform to deliver NILVAD and to support future collaboration in Alzheimer disease research.

For more information please visit: http://www.molecularmedicineireland.ie/show/item/1/1733

ECRIN is an EU-funded research infrastructure set up to support multi-national, investigator clinical trials in Europe. The ECRIN Correspondent is the link between the Irish and European clinical research networks and is an invaluable resource to Irish-based principal investigators who are seeking funding for multi-centre clinical trials in Europe.

For further information on ECRIN visit www.ecrin.org
Clinical Trials Liaison Services

Since April 2009, Enterprise Ireland has funded the post of Clinical Trials Liaison Officer (CTLO) as an extension of ICRIN’s services. The role facilitates the development of processes, knowledge and awareness of clinical research and resources among indigenous and multi-national pharmaceutical, medical device and diagnostic companies to enable them to bring their products to market. Fionnuala Gibbons was appointed CTLO in April 2009.

The CTLO directly supports researchers, clinicians and companies to develop and deliver cutting edge research in a safe and regulated environment. To date, the CTLO has engaged with over 250 companies, researchers and service providers. This includes 52 research projects, 38 high potential start-up companies, 26 pre-start-up companies, 45 established companies, 15 multinational companies and 72 clinical service providers. In particular, the CTLO has provided support and advice to a number of companies contemplating setting up in Ireland. The CTLO promotes Ireland as a location for clinical trials.

The key services provided include: (i) linking groups with suitable regulatory expertise, (ii) outlining EU and FDA regulations, (iii) making introductions to the Irish competent authority, (iv) advising and supporting the development and review of clinical investigation plans and relevant documentation, (v) identifying clinical expertise in Ireland, (vi) advising on requisite quality management systems, (vii) facilitating clinical focus groups, and (viii) reviewing marketing and labelling information.

In addition, the CTLO provided support to Enterprise Ireland for the MedInIreland - Medical Technology and Healthcare Expo 2011 and the Clinical Innovation Awards. This event profiled Ireland as a globally recognised centre of excellence in medical device and diagnostic technologies, and a location of choice for R&D, manufacture and marketing of highly innovative medical products.

The support provided by the CTLO to industry is key to translating Irish research into internationally commercial outcomes as well as providing sustainable business and jobs for the Irish economy.
ICRIN is developing a web-based repository of harmonised processes and procedures for clinical research

In 2011, ICRIN initiated the development of a web-based repository to provide clinical researchers from academia and small and medium-sized enterprises (SMEs) in the pharmaceutical and medical device industries with a single on-line resource of the relevant information and tools required to facilitate harmonised, quality clinical research in Ireland. It is available on the MMI website at:

www.molecularmedicineireland.ie/icrin

This first phase of the ICRIN website development involved posting content under the following categories:

1. General information on clinical research in Ireland
   
   This section contains information on the specialist areas relating to competent authority and ethical requirements for clinical research in Ireland, as well as research governance and sponsorship. It includes general information on medical devices, other interventional therapeutic trials not using medicinal products or devices, diagnostic and/or epidemiological studies.

2. Clinical research tools and guidelines for studies with investigational medicinal products (IMPs)
   
   By the end of 2011 this section contained 12 template forms and standard operating procedures (SOPs) for clinical studies including the confidentiality agreement template, the risk assessment template, a checklist for quality assessments of protocols and protocol amendments and the site evaluation and training procedure.

3. Flow diagrams of clinical trials processes
   
   This section contains flow diagrams and project management tools for clinical trial processes with embedded links for guidance documents, templates and procedures.

   The next phases of development will include the completion of tools required for the development of IMP trials, definition of tools for medical device trials, a directory of CRC/Fs in Ireland, a directory of service providers in clinical research in Ireland, training resources, links to disease networks and costing tools for clinical research.
ICRIN Website Development (Cont’d)

Clinical Trial Recruitment Phase & Close Out Phase

The diagram below illustrates the flow of activities from the recruitment phase to the close out phase of a clinical trial.

TIME
First Patient/Subject Recruited to study report/publication

Recruitment/Treatment First patient in to last patient out

Last Patient out to Study Report/Publication

TIME

Ongoing Patient/ Subject Recruitment & Treatment

Interim site monitoring as per Monitoring Plan
Link SOP

Monitoring close out visits
Link SOP and Template

Ongoing Data Collection, validation as per the Data Validation Plan
Link SOP (available soon)

Final validation query resolution
SAE reconciliation, preparation for Database Lock

Follow up on open SAE cases to resolution/outcome. Reconciliation with Data Management
Link SOP (available soon)

Ongoing SAE processing and Reporting
Link SOP and Templates (available soon)

Database Lock
SOP (available soon)

Database Lock
SOP (available soon)

Statistical Programming and testing, Interim analyses
Link SOP (available soon)

Final validation and reconciliation with Data Management
Link SOP (available soon)

Statistical Program testing with blinded dirty data

End of Trial Notifications to CA and REC
Link to Form

Training/Refresher training as required by the study

Unblinding Statistical Analysis/Reporting
SOP (available soon)

Interim QA audits as per Quality plan
Link to SOP (available soon)

Project Management, status reporting, issue resolution, contingency planning, communication etc., Continuous Improvement/ Lessons Learned
Link SOPs/Templates (available soon)

Final study Report/ Publication
SOP (available soon)
Dublin Centre for Clinical Research (DCCR)

The aim of the DCCR is to provide clinical research infrastructure to support collaborative clinical research studies across Dublin.

In June 2006 a DMMC bid involving TCD, RCSI, UCD and the DMMC (forerunner of MMI) and led by Professor Dermot Kelleher secured investment from the Wellcome Trust and the Health Research Board for the Dublin Centre for Clinical Research (DCCR). This programme involves the construction of a 1,350m² clinical research facility at St. James’s Hospital and the development of a city-wide clinical research network linking the St. James’s facility with those already in place at the Beaumont, Mater and St. Vincent’s University Hospital sites.

DCCR Highlights for 2011

Key development of the DCCR Programme in 2011 were:

- Signing of building contract on 7 November for the construction of the CRF at St. James’s Hospital, which is now scheduled for completion in December 2012.

- DCCR CRFs in Dublin held their first open days in 2011, with the RCSI CRC holding an event to coincide with International Clinical Trials Day on 20 May and the UCD CRC at SVUH holding a similar event on 21 September.

- The DCCR held its inaugural Scientific Meeting on 14 October which featured presentations from four of the DCCR Disease Groups (Neuropsychiatry, Respiratory, Prostate and Stroke) and three young DCCR Investigators as well as a keynote address by Professor Barry Coller of Rockefeller University Medical School.

- The third cohort of research nurses started the Certificate Course in Research Nursing, which has been developed and run by the RCSI on behalf of the DCCR partner organisations.

- Supporting a National Irish Heart Foundation by providing access to the study’s eCRF from collaborating sites in Cork, Galway as well as Dublin.

- Following regulatory approval from the IMB, the DCCR Network commenced a clinical trial of a medical device used by patients with asthma.

- Late in 2011, the DCCR Network hosted a rotation for the scholars of the Clinical and Translational Research Scholars Programme (CTRSP) to introduce them to clinical research undertaken in all four DCCR Partners (RCSI, UCD, TCD and MMI).

- The DCCR supported a number of investigators submitting grant applications to research funding agencies in 2011. Notable examples included:
  - Prostate Cancer Research Consortium – SFI/HRB Translational Science Award
  - Respiratory (Inhaler Device) – HRB Health Research Award
  - Stroke Biomarkers (BIOVASC) – HRB Clinician Scientist Award

Prof Barry Coller, Rockefeller University Medical School, presents the DCCR Young Investigator Award to Dr Sanjay Chotirmall at the DCCR 2011 Scientific Meeting in October.
In November 2011 a building contractor was formally appointed to construct the clinical research facility at St. James’s Hospital. The building is now scheduled for completion in December 2012 and is expected to be opened in the Spring of 2013.

DCCR Oversight Board

The DCCR Oversight Board was established in 2011 to assess the progress of the DCCR in establishing and developing a successful clinical research facility (CRF) at St James’s Hospital and a successful co-ordinated research network of CRFs across Dublin. The Oversight Board is charged with providing oversight and strategic guidance to the Consortium Board, the CRF Management Team and the DCCR Network Management Team. Seven board members were appointed under the chairmanship of Joe Harford, Chair of the National Institute for Bioprocessing Research and Training (NIBRT) and the first meeting was held on 22 November 2011.
In October 2011, the DCCR held its inaugural Scientific Meeting which aimed to showcase the range of clinical research studies being undertaken in the DCCR Network. Presentations from four of the DCCR Disease Groups, Neuropsychiatry, Respiratory, Prostate and Stroke, illustrated how a range of clinicians are taking advantage of the DCCR infrastructure to address clinically relevant questions, such as, are there clinically useful biomarkers that can inform better treatment approaches to prostate cancer, and to what extent is morbidity in Asthma due to poor inhaler technique.

The keynote speech, “The Joys of Translational Research - The story of Abciximab’s development”, was delivered by Professor Barry Coller of Rockefeller University Medical School. Professor Coller’s speech provided a tour de force of what can be achieved for patients when translational research works properly.

The Scientific Meeting also featured presentations by Dr Jane McGrath (TCD), Dr Sheng Oon (UCD) and Dr Sanjay Chotirmall (RCSI) who competed for the DCCR Young Investigator Award. Their respective presentations focused on the use of 3Tesla MRI to better understand the how the brain works, the identification of biomarkers and the development of a new therapeutic approach based on stabilising oestrogen hormone levels for the treatment of Cystic Fibrosis. The presentations were judged by the keynote speaker, Professor Coller, who selected Dr. Chotirmall for the award.

At the end of the meeting, Professor Coller was presented with a TCD School of Medicine Tercentenary Medal by Professor Dermot Kelleher, Head of the TCD School of Medicine, marking the School’s foundation in 1711.

DCCR 2011 Scientific Meeting
The DCCR Network works with the support of disease, or clinical interest groups. Scientists and clinicians with similar research interests come together to agree on research activity that is best conducted as a large group rather than in isolation. This works particularly well where large volumes of patients are required for a research project, or where a particular condition is rare and identifying suitable patients requires a collaborative effort. Since its inception in 2008 to the end of 2011, 3,434 patients have been recruited to DCCR Network studies. The table below illustrates the studies underway within the DCCR Network and the sponsoring disease groups.

### DCCR Disease and Clinical Interest Groups

The DCCR Management Team approves the use of DCCR Network resources to support these studies by: providing research nursing resources for recruiting and consenting patients into studies and gathering clinical information and samples following an agreed protocol and SOPs; providing IT support to studies usually in the form of developing eCRFs (electronic case report forms) and designing study specific databases; facilitating sample processing and storage; and, assisting investigators with study protocol development and research ethics applications.

<table>
<thead>
<tr>
<th>Study</th>
<th>Disease Group</th>
<th>HOSPITAL SITE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beaumont</td>
</tr>
<tr>
<td>GUIDANCE</td>
<td>Diabetes</td>
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</tr>
<tr>
<td>Idiopathic Pulmonary Fibrosis/ Sarcoidosis</td>
<td>Pulmonary</td>
<td>x</td>
</tr>
<tr>
<td>Coeliac</td>
<td>Gastrointestinal Medicine</td>
<td>x</td>
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<tr>
<td>Schizophrenia Risk Mutations</td>
<td>Neuropsychiatry</td>
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<tr>
<td>Barrett’s Oesophagus</td>
<td>Gastrointestinal Medicine</td>
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<tr>
<td>Chronic Kidney Disease</td>
<td>Chronic Kidney Disease</td>
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<tr>
<td>Inhaler</td>
<td>Pulmonary</td>
<td>x</td>
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<tr>
<td>Biomarker Validation</td>
<td>Prostate Cancer Research Consortium</td>
<td>x</td>
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<tr>
<td>Interferon Gamma Release Assays</td>
<td>HIV/Tuberculosis</td>
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<tr>
<td>Young Onset Neurodegeneration</td>
<td>Neurodegeneration</td>
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<tr>
<td>Early Onset Severe Retinal Dystrophy*</td>
<td>Ophthalmology</td>
<td></td>
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<tr>
<td>Transient Ischemic Attack &amp; Stroke Biomarker</td>
<td>Irish Heart Foundation (IHF) Cardiovascular Group</td>
<td></td>
</tr>
<tr>
<td>Aspirin Compliance Study</td>
<td>IHF Cardiovascular Group</td>
<td>x</td>
</tr>
</tbody>
</table>

* *Study also being conducted at the Royal Victoria Eye and Ear Hospital.*

### Hospital Abbreviations:

- **JCM** – James Connolly Memorial
- **Mater** – Mater Misericordiae University Hospital
- **SJH** – St James’s Hospital
- **SVUH** – St Vincent’s University Hospital
- **AMNCH** – Adelaide and Meath Hospital incorporating the National Children’s Hospital
Publications

In terms of outputs, the DCCR’s Network has contributed to the generation of a wide range of publications. Specific examples of publications in 2011 include:


7. Core fucosylation and alpha2-3 sialylation in serum N-glycome is significantly increased in prostate cancer comparing to benign prostate hyperplasia, Glycobiology. 2011Feb;21(2):195-205.

8. IL-10 blocks phagosome maturation in Mycobacterium tuberculosis-infected human macrophages, American Journal of Respiratory Cell and Molecular Biology, 45, (1), 2011, p172 - 180


10. Mycobacterium tuberculosis infection induces non-apoptotic cell death of human dendritic cells., BMC Microbiology, 11, (1), 2011, p237-


12. The Application of High-Content Analysis in the Study of Targeted Particulate Delivery Systems for Intracellular Drug Delivery to Alveolar Macrophages., Mol Pharm, 2011
Translational Research

Insights into Successful Translational Research

Molecular Medicine Ireland (MMI), Science Foundation Ireland (SFI) and the Health Research Board (HRB) co-hosted a one day workshop entitled “Insights into Successful Translational Research” on the 29th November 2011, which was attended by over 140 researchers from many different scientific and medical fields.

The keynote speakers Prof Bernard Munos, founder of the Inno Think Centre for Research in Biomedical Innovation and Prof Steve Jackson, Gurdon Institute in Cambridge spoke passionately about the need to encourage innovation and entrepreneurship. There were a number of presentations from many Irish-based researchers, involved in translational research and a presentation on translational infrastructure and resources available to researchers.

Themes included: the need for more collaboration and networks, the necessity of balancing commercial and academic interests, technology transfer and funding for bridging early translational work and clinical/commercial deployment.

The conclusions of the day, chaired by Prof Ena Prosser were as follows:

- R&D failure in industry was not a failure of science but rather a failure of governance.
- There is a need to reward scientists and engage younger scientists.
- There is a need to identify strengths in Ireland to focus on diversity, in particular, of training is a strength that we should harness
- Utilise European and international connections and synergies to benefit Ireland.
Two new technology platforms in the area of Marine Biodiscovery were added to the MMI Technology-Platform Web-Portal in 2011.

These are the Marine Biodiscovery Research Laboratory at the Marine Institute in Oranmore, County Galway and the High Throughput Robotics Platform in the Marine Biotechnology Centre, based in the Environmental Research Institute in University College Cork. Both platforms are partners within the National Marine Biodiscovery Research Initiative and are open to external collaboration and service provision. For further information visit: www.molecularmedicineireland.ie/show/item/1/1578

The MMI Technology Platform Web-Portal includes technology platforms and associated expertise that support clinical and translational research that are currently available across Irish Institutions. The web portal currently hosts 64 technology platforms and institutions can directly submit further technologies to this website.

A brochure summarising the Technology Platform Web-Portal was launched in November 2011 to highlight the web-portal as a publicly accessible, online directory of technology platforms and expertise in Ireland. The majority of the technology platforms are open to external collaboration and service provision. The brochure was distributed to organisations in the biotechnology industry in Ireland.
Research Highlights across MMI Partner Institutions

Prostate Cancer Research Consortium

The Prostate Cancer Research Consortium was awarded its third consecutive programme grant from the Irish Cancer Society which commenced in September 2011. Building on the Prostate Cancer Research Consortium’s track record and significant research experience in biomarker discovery and validation, this programme grant will address the clinically important question of identifying biomarkers which can distinguish between pathologically insignificant and significant disease.

Harnessing the consortium’s critical mass it will investigate biomarkers from genes to proteins to post-translational modifications to pathological images across multiple biological matrices available in its unique bioresource. Starting from a null hypothesis, novel and established data integration approaches will be applied to the data set utilising the expertise in biostatistics and machine learning available within the consortium. The refined panel of biomarkers will then be validated in samples from our international collaborators. This programme aims to deliver a defined panel of biomarkers which can be interrogated in pre-operative serum, urine and biopsy tissue samples which will identify patients with insignificant disease, ultimately impacting on the patients’ quality of life but also giving them the confidence to delay radical therapy.

Members of the consortium have also leveraged grants from the Health Research Board/Science Foundation Ireland Translational award and the FP7 Maria Curie academic-industrial partnership. Dr Antoinette Perry and Dr Stephen Finn were also awarded Young Investigator awards from the Prostate Cancer Foundation in the US. These awards build on the international funding portfolio and collaborations of the consortium to address its central question of better biomarkers to inform appropriate treatment options.

JINGO - Joint Irish Nutrigenomics Organisation Consortium

JINGO comprises an all-Ireland research partnership between UCD, UCC, TCD, UU and their affiliated hospitals and aims to build a national nutrition and genetics database. Due to be completed in 2013, this 5-year project is funded by the Department of Agriculture, Food and Marine and the Health Research Board to the value of €10 million, and has more recently leveraged an additional €1.4 million from the Department for Employment and Learning of Northern Ireland.

Food and Marine and the Health Research Board to the value of €10 million, and has more recently leveraged an additional €1.4 million from the Department for Employment and Learning of Northern Ireland.

The project, the largest of its kind worldwide, is integrating dietary, health and genomic data from 7,000 Irish adults of all ages recruited through 3 studies: the National Adult Nutrition Survey (NANS), the Trinity-Ulster-Department of Agriculture (TUDA) and Metabolic Challenge (MECHE) studies.

Findings from the NANS food consumption database were showcased in March, an event which featured the launch of its summary report (www.iuna.net). Preliminary results from both the TUDA cohort of almost 5,000 elderly adults exhibiting early stage cognitive dysfunction, bone disease and hypertension, and from the MECHE postprandial nutrition trial were presented at a significant joint meeting of the Irish Nutrition Society and the American Society for Nutrition at University College Cork in June. Progress of all 3 projects can be followed through www.ucd.ie/jingo and www.facebook.com/jingoproject.

Expected to uncover hitherto unknown relationships between diet, genes and health, the JINGO biobank will position Ireland at the forefront of Nutrigenomics and health internationally, with collaborative discussions already underway with groups in the EU and US.
Perinatal Ireland

Perinatal Ireland is a multi-centre, all-Ireland research consortium focused on research into women’s and children’s health. The consortium, primarily funded through an Imaging Award from the Health Research Board (HRB), links eight maternity hospitals across the island, harnessing the expertise of Ireland’s leading maternal fetal medicine specialists. The consortium provides a unique, world-class research infrastructure, comprising state-of-the-art imaging equipment, dedicated research and management personnel together with a central management and governance structure. With access to large patient populations, Perinatal Ireland is uniquely positioned to carry-out innovative and ground-breaking clinical and translational research.

The consortium has recently published the key findings of its first major study: the ESPRiT Study. ESPRiT was a two year programme, which recruited over 1000 twin pregnancies to evaluate sonographic predictors of restricted growth. The study also examined the correlation of Doppler waveform patterns with placental morphology in twin pregnancies.

Perinatal Ireland’s next major study, PORTO, is soon to finish recruitment and has over 1200 patients enrolled so far. The primary aim of PORTO is the investigation of multi-vessel Doppler in the management of growth restricted fetuses. A number of other studies are also currently in progress and they include the NOTES Study which is a follow-up to ESPRiT. It is investigating neurodevelopmental outcomes in twins at age two. This project is funded through an award from the Children’s Medical Research Foundation. StOOPS is a follow-up study to PORTO, which aims to investigate and quantify patterns of brain injury, volume and function in infants using advanced 3T magnetic resonance imaging. The StOOPS study is funded by the Children’s Fund for Health.

For more information, visit our website at www.perinatalireland.ie

The Irish Longitudinal Study on Ageing (TILDA)

TILDA is a study of a representative cohort of over 8,500 people resident in Ireland aged 50+, charting their health, social and economic circumstances over a 10-year period. The first wave of TILDA data was collected from late 2009 to early 2011. Key findings to date emphasize the enormous contribution that older persons make to society in Ireland, the major opportunities to improve health risk factors which prevent heart disease, stroke, falls and dementia, and the opportunities to improve pension and financial literacy.

Technology innovations are developing quick, simple tools to measure abnormal heart rhythms and early patterns of cognitive decline. The TILDA dataset has already created new employment opportunities for young researchers throughout Ireland, generated employment for SMEs in Ireland and attracted considerable additional resources from international funding bodies which further create research, development and employment opportunities in Ireland.
Communications

**MMI Website, an interactive platform for collaborative research**

The MMI Website provides our visitors with up-to-date information on MMI activities, news, events and career opportunities.

MMI website users can register and maintain an up-to-date research profile, as well as apply for MMI courses and workshops. Collaborative Groups working under the auspices of MMI can communicate and share documents via dedicated secure areas on the website. Dedicated areas enable easy access to key collaborative resources in clinical and translational research.

**MMI On-line Newsletter**

The MMI Newsletter features quarterly updates on all MMI activities. Over 3000 users received the newsletter in 2011.
Website Analytics

Visitors Overview

1st Jan 2011 - 31 Dec 2011
Compared to previous 12 months

Visits: $+10.26\%$ \[44,371 \text{ v } 40,242\]
Unique Visitors: $+28.21\%$ \[21,260 \text{ v } 16,582\]

Visits 01 Jan - 31 Dec 2011
Visits 01 Jan - 31 Dec 2010

45.35% New Visitor
20,121 Visits

54.65% Returning Visitor
24,250 Visits
## Financial Report

### INCOME AND EXPENDITURE ACCOUNT

**Year Ended 30 September 2011**

#### INCOME

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<thead>
<tr>
<th></th>
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<tbody>
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<td>Grants</td>
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<td>476,026</td>
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**TOTAL INCOME** 1,151,254 1,166,631

#### EXPENDITURE

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<td>907,075</td>
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<td>Professional and consultancy fees</td>
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<td>Insurance</td>
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<td>Travel and subsistence</td>
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<td>Depreciation:</td>
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<td>- Fixtures and fittings</td>
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<td>- Computer equipment</td>
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<td>- Office equipment</td>
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<tr>
<td>Auditors' remuneration</td>
<td>11,160</td>
<td>11,163</td>
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</table>

**TOTAL EXPENDITURE** 1,151,254 1,166,631

**Profit for the year** - -

*unaudited*
In June 2011, MMI welcomed the appointment of two new staff members to the ICRIN team: Dr. Suzanne Bracken as Programme Officer for Translational Research, and Susan Lennon as Clinical Research Manager.

Dr Suzanne Bracken has over 5 years experience in the In Vitro Diagnostics industry where she was employed as a Senior Research and Development Scientist at Biotrin International. Suzanne has experience in design conception and feasibility research for new product developments, as well as process redevelopment and technical support for post-market products. She graduated in 2006 with a PhD in Immunology from the Institute of Molecular Medicine, St. James's Hospital and Trinity College Dublin and she also holds a Masters degree in Biomedical Science from the University of Ulster, Coleraine.

Susan Lennon has over 20 years experience in the pharmaceutical industry and, in particular, in the implementation of clinical trials within contract research organisations (CROs). In the CRO industry she held roles in the management of data management and laterally as European Head of Pharmacovigilance with responsibility for the implementation of the Clinical Trials Directive. Susan has also held a number of senior positions in customer relationship management. She has a Masters in Biotechnology and a BSc in Microbiology/Biochemistry from University College Cork.

In December 2011, MMI recruited Stefan Hanevy as Project Assistant in Clinical and Translational Research under the FÁS JobBridge Internship Scheme. Stefan graduated in 2011 with a BSc in Biotechnology from NUI Galway and is looking to pursue a career in clinical research.
During 2011, MMI welcomed the assistance of Faelan Herriott and Stefan Hanevy, participants of the FAS JobBridge Internment Programme.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AdeNOS</td>
<td>Adenovirus-mediated delivery of eNOS</td>
</tr>
<tr>
<td>AMNCH</td>
<td>Adelaide &amp; Meath incorporating the National Children’s Hospital</td>
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<tr>
<td>APC</td>
<td>Alimentary Pharmacological Centre</td>
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<tr>
<td>BBMRI</td>
<td>Biobanking and Biomolecular Resources Research Infrastructure</td>
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<td>Beaumont</td>
<td>Beaumont Hospital</td>
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<td>BIOMERIT</td>
<td>BIOMERIT Research Centre</td>
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<td>BMP</td>
<td>Bone Morphogenetic Protein</td>
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<td>BSI</td>
<td>Biosciences Institute</td>
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<td>CERVIVA</td>
<td>The Irish Cervical Screening Research Consortium</td>
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<tr>
<td>Conway</td>
<td>UCD Conway Institute of Biomolecular &amp; Biomedical Research</td>
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<tr>
<td>CRC</td>
<td>Clinical Research Centre</td>
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<td>CSCB</td>
<td>Centre for Synthesis and Chemical Biology</td>
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<td>CSFP</td>
<td>Clinician Scientist Fellowship Programme</td>
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<td>CTGF</td>
<td>Connective Tissue Growth Factor</td>
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<td>CTLA4</td>
<td>Cytotoxic T-Lymphocyte Antigen 4</td>
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<td>DCCR</td>
<td>Dublin Centre for Clinical Research</td>
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<tr>
<td>DMMC</td>
<td>Dublin Molecular Medicine Centre</td>
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<tr>
<td>ECRIN</td>
<td>European Clinical Research Infrastructures Network</td>
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<td>EM</td>
<td>Electron Microscopy</td>
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<td>EMT</td>
<td>Executive Management Team</td>
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<td>eNOS</td>
<td>Endothelial Nitric Oxide Synthase</td>
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<td>Education and Research Centre</td>
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<td>European Union Framework Plan</td>
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<td>Framework Programme 7</td>
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<td>Good Clinical Practice</td>
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<td>IL2</td>
<td>Interleukin 2</td>
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<tr>
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<td>Liquid Chromatography</td>
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<td>Molecular Medicine Ireland</td>
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<tr>
<td>MS</td>
<td>Mass Spectrometer</td>
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<td>MSCs</td>
<td>Mesenchymal Stem Cells</td>
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<td>Prostate Cancer Research Consortium</td>
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<td>PEDF</td>
<td>Pigment Epithelium Derived Factor</td>
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<td>PHG</td>
<td>Programme for Human Genomics</td>
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<td>Principal Investigator</td>
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<td>PRC</td>
<td>Proteome Research Centre</td>
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<td>PRTLI</td>
<td>Programme for Research in Third Level Institutions</td>
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<td>Royal College of Surgeons in Ireland</td>
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<td>Regenerative Medicine Institute</td>
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<td>TEM</td>
<td>Transmission Electron Microscope</td>
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<td>University College Dublin</td>
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<td>UKCRCN</td>
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<tr>
<td>ZAG</td>
<td>Zinc-R2-glycoprotein</td>
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